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ABSTRACT

For many engineers, writing skills have proven to be almost as important as technical background. Many prominent engineers have found that writing often consumes one-fourth of their time; they are expected to submit reports and proposals and give presentations. Many engineering schools now require either additional writing courses or integrate writing skills into existing courses. The Accrediting Board for Engineering and Technology (ABET) has issued guidelines to guarantee that engineering schools deal with such a curriculum deficiency. This is commendable and greatly needed, but it is only a first step. Job-related writing requires different skills than student writing. While student papers usually have single authorship, job-related writing is often collaborative, having multiple authors. Devoting more of the engineering curriculum to writing is not the complete solution. Collaborative teamwork is also vital, and undergraduate courses should reflect the engineering profession and give students a professional orientation. College and university faculty can encourage collaborative writing skills by requiring papers and projects resulting from a cooperative effort. In addition, employers can provide continuing education opportunities and additional training to encourage the technical professional. Strengthening the engineer's communication skills not only ensures quality, accuracy, and upward mobility, but also protects the reputation of the engineering profession. (12 references) (GL)

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Communication Skills: A Bonus For Engineers

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Abstract

The area of technical communications is a field of increasing importance. Like-
wise, it is an area which has been neglected for undergraduates in the engineering
disciplines. Suggestions are offered for dealing with this deficiency.

What skills are important for engineers? Engineers entering the job market generally feel
technically competent. If a feeling of inadequacy exists, it is typically in the realm of
communications skills. However, communication skills are extremely important if their
work is to be favorably received. For many engineers, their writing skills have proven to be
almost as important as their technical background.

With our increased reliance on electronic communications, it is sometimes difficult to
convince technical professionals that writing skills are still necessary. The fact is that
advances in telecommunications have placed a new premium on their communication skills.
Even with the prospect of a paperless society, the ability to express ourselves accurately
will always be important.

Engineers are expected to submit reports, proposals, and give presentations. Many
prominent engineers find that writing often consumes one-fourth of their time.¹ Their work
often can be the basis for high-level decisions. Responsible documentation will always be
an important part of an engineer's job, and writing skills are a crucial part of this.

Poorly written documents can undermine and cause misinterpretation of outstanding
technical work. Communications skills, especially writing, are not just an asset but crit-
ical. Estimates show that approximately 60% of all communications fail to achieve their
purpose.² We don't realize how critical this is until tragedy strikes. The Rogers commission
report cited communication problems between Morton Thiokol and NASA during the entire
booster joint design and development process.³

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Many engineers consider writing to be an onerous task, not an opportunity for career enhancement. The reality is that engineers with highly developed writing and communication skills generally achieve upward mobility faster than their less communicative counterparts. Many engineers find that their careers can be seriously limited if they cannot write well. Some employers have actually stated that employees without good writing skills don't last very long.⁴

Writing is a logical process; its practice enables clear expression of ideas. Engineers are used to logical thinking, and writing should be a natural for them. Their organizational skills should be used to develop problems and ideas for proposals, reports, and presentations. Self perception is the barrier for engineers. They need feedback and encouragement throughout the course of their undergraduate and professional education.

Writing skills take time and practice. The average engineering curriculum has very little time allotted to writing and communications skills.⁵ Some schools fail to agree on how engineering students should be taught writing skills. Does the responsibility lie with the engineering curriculum committees or the english departments?

Many engineering schools are now requiring either additional writing courses or integrating writing skills into existing courses.⁶ The Accrediting Board for Engineering and Technology (ABET) has issued guidelines to guarantee that engineering schools deal with such a curricular deficiency. Engineering schools are under pressure to improve both oral and written communication skills for their graduates. This is in response to criticism from both practicing engineers and the ABET guidelines which have recommended that graduates have a proficiency in communications skills.⁷ This is commendable and greatly needed, but only a first step.

Why should writing at work present problems? As undergraduates, the closest most engineering students come to technical documentation are lab reports. Job-related writing has a different orientation than student writing. First, student writing is evaluated differently than writing at work. Second, student writing focuses on finite problems rather than the open-ended problems often encountered on the work scene. And finally, student papers usually have single authorship, where job-related writing may be collaborative having multiple authors.⁸ The adjustment to these three factors is a large part of the "backpack-to-briefcase" transition faced by the new engineer.

Devoting more of the engineering curriculum to writing is not the complete solution.

Collaborative teamwork skills are also vital. Undergraduate courses need to reflect the engineering profession, and give to student a professional orientation. The reality of the work environment usually finds engineers working, and therefore, writing in groups.^{9,10,11} College and University faculty can encourage these skills by requiring that papers and projects result from a cooperative effort. Engineering courses can help students acquire both collaboration and writing skills.

Teaching collaborative strategies to undergraduates prepares them for future job demands. Many technical documents written on the job are the result of a variety of efforts. For example, not every group member needs to contribute written material to a technical report. Sometimes one person contributes tables or graphics, another provides the data analysis, while only one or two members of the group actually do the writing. This type of strategy could also be adapted for undergraduates. The roles can vary from writer to data analyst, depending upon the nature of the project and the areas of individual expertise. Students should also be encouraged to present their papers.

If the students have the opportunity to assume various roles in their course, their collaborative experience will transfer to the workplace. With a little planning and imagination, engineering students can experience a wide range of team experiences during their undergraduate years.

Engineering courses can be revamped to give the students experience in collaborative strategies, as well as general writing practice. Innovative curricula have been proposed that incorporate teamwork into courses.¹² Class projects and papers done by a group can allow students to practice both writing and collaboration. This instructional strategy best simulates the work environment, and thus the role new engineers will ultimately assume.

Engineering curricula are being revised. Employers can provide continuing education opportunities and additional training to encourage the technical professional. Strengthening the engineers communications skills not only ensures quality, accuracy, and upward mobility, but also protects the engineering profession.

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